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THE PLATFORM OF THE FORESTER

In order to assist its readers to grasp present problems the FORESTER indicates five directions in which an effective advance is chiefly needed.

1. The forest work of the United States Government which is now being carried on by the Department of Agriculture, the General Land Office, and the Geological Survey, should be completely and formally unified. The division of authority between the three offices involves great waste, and consolidation is directly and emphatically pointed to by the present voluntary co-operation between them.

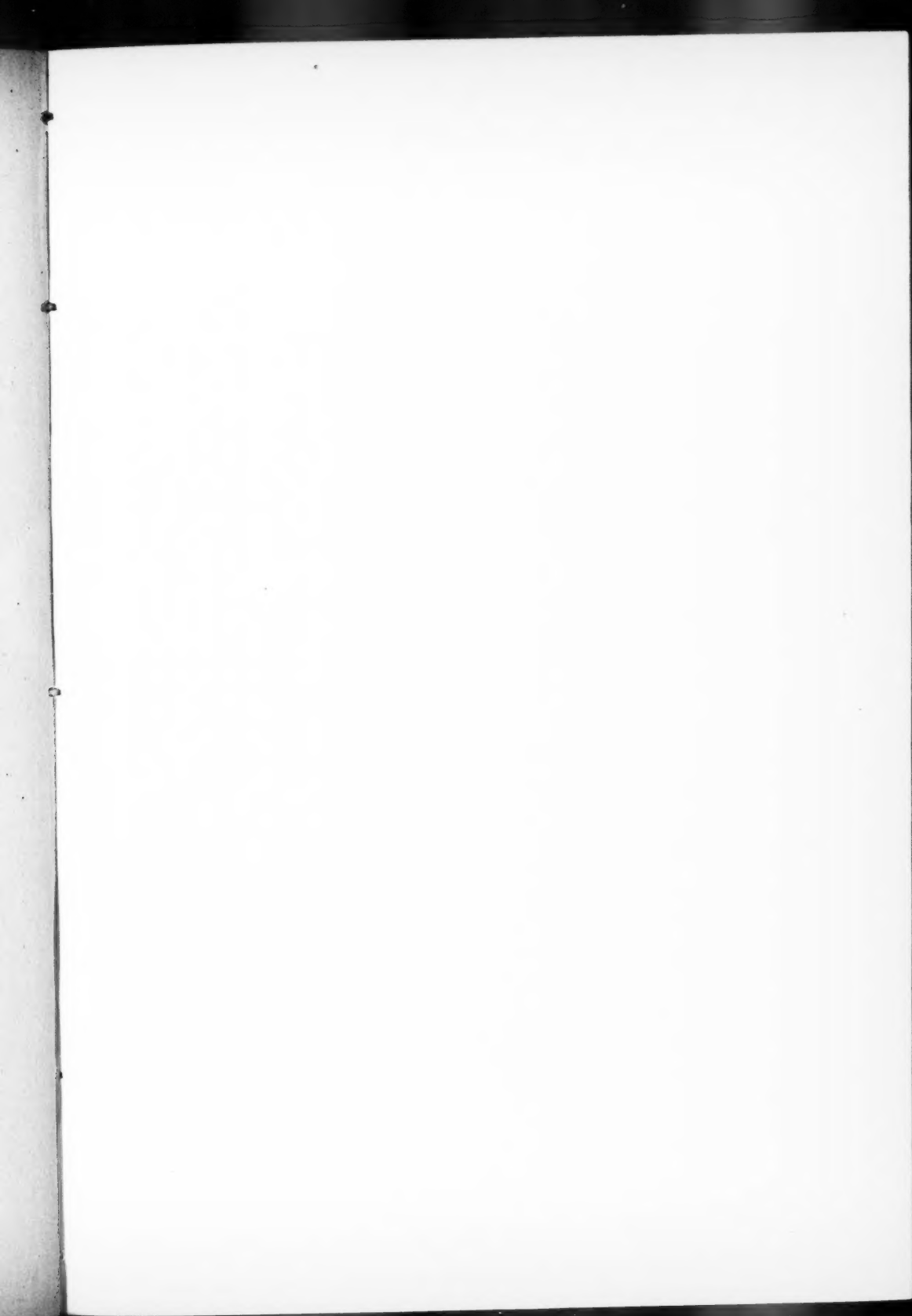
2. A system of forest management under the administration of trained foresters should be introduced into the national and state forest reserves and parks.

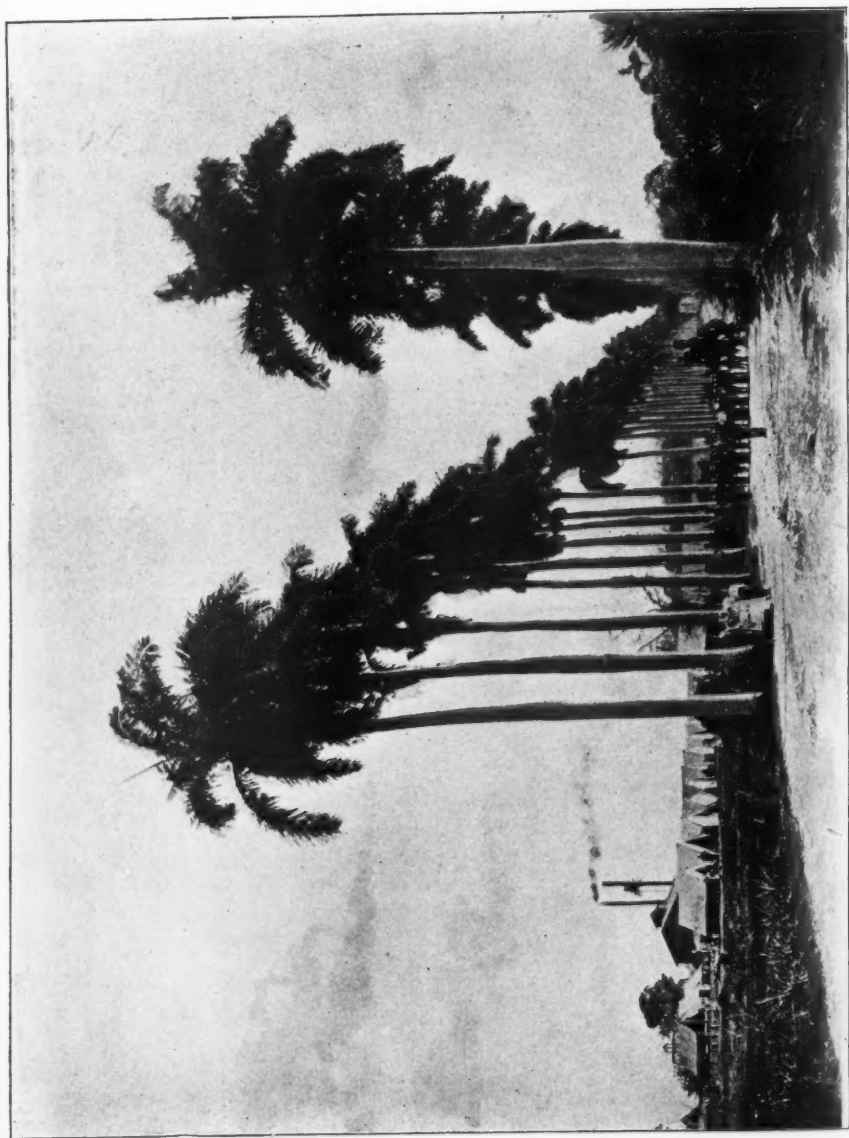
3. Laws for the protection of the forests against fire and trespass should be adapted to the needs of each region and supported by the provisions and appropriations necessary for their rigorous enforcement.

4. Taxation of forest lands should be regulated so that it will encourage not forest destruction but conservative forest management.

5. The attention of owners of woodlands should be directed to forestry and to the possibilities of applying better methods of forest management.

Persons asking themselves how they can best serve the cause of forestry will find suggested here lines of work along which every effort will tell. No opportunity for doing good along these lines should be neglected.





AN AVENUE OF ROYAL PALMS AND AN AMERICAN ENCAMPMENT IN CUBA.

THE FORESTER.

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SILVICULTURAL PROSPECTS OF THE ISLAND OF CUBA.

BY JOHN GIFFORD.

It is my intention in this paper to emphasize the great advantages of southern countries in the production of wood and other forest products, and the great need of a botanic garden and experimental station in either Cuba or Porto Rico.

It seems to me that the two most important factors which determine the financial profits of forestry are location in reference to markets, and the ability to produce quickly materials for which there is demand. There are other profits of course which cannot be measured in dollars and cents, but these are more or less local and, although important, must be considered in a special way for each locality. The most important points are to produce quickly what you sell, and to sell quickly what you produce. It is of course self-evident that the nearer one operates to a great market the more intensive may be the system of management and the larger will be the profits. This statement, however, was far more applicable in times past than at present. The abundance of other materials such as coal, iron and stone modify this condition. By modern transportation with special long-distance freight rates, distances have been shortened, time saved, and regions which were formerly inaccessible brought comparatively near. In consequence the pinch of want is not seriously felt until the forest resources of the remotest corners of our land are exhausted. Even then unless hindered by tariff barriers the deficiency may be supplied by neighboring countries. Shingles from Oregon, Yellow Pine from Georgia, and White Pine from Minnesota

may all be bought at reasonable prices in almost every country lumber yard. Yellow Pine floors are common in Europe; wood from California is common in the Orient; and even the ties of the railroads in the diamond mines of Kimberley are Pacific Redwood. This is of course all due to modern transportation, so that after all location is not the most important factor. In Cuba the great difficulty is the lack of communication. It is as easy to go from Santiago to Havana by way of New York, as it is by land or even by water in Cuba. Later when railroads are built the conditions throughout the island will be much more uniform.

It seems to me that silviculture in its intensive form is not only the concomitant but the consequence of agriculture. It belongs, therefore, more to the populated and cultivated regions of the earth than to the wild remoter regions. In its more extensive form it is of course more or less applicable to remoter regions, in fact to all regions where wood will grow and where wood has value. But the law of diminishing return applies as much to forestry as to other industries and in a country so vast and undeveloped as the United States it is not difficult at present to find regions where the profits are not equal to the cost of protection and intelligent supervision, the primary essentials of forestry.

I refer only to private holdings and it is my intention to discuss only the possibilities of the practice of intensive silviculture by private persons in Cuba. Both this island and Porto Rico are practically de-

void of good timber and the time is at hand when it will pay to plant trees as a crop in these islands. At the same time it is surprising how well certain peoples manage without wood. The houses of the rich in Cuba are of stone; of the poor of thatch. In Italy even vine props are cut from solid granite.

Although Cuba has suffered in many ways she is not in a wild and semi-barbaric state. Although hampered by strife and oppression she has been under a fair state of cultivation for many years. Cuba was blooming when a large part of this country was an unexplored wilderness. Her sugar and tobacco industries have been famous for many years, and although she is comparatively rich she is no longer an immense mine of resources. The forests of a large part of the island have been long ago exhausted, and the same would have happened to the remainder had they been accessible. Even these are thin, having been culled of their richest hardwoods. The time is certainly ripe for tree planting in Cuba. I know of no place where a person could plant forests with more assurance of profit than in this island.

I say assurance of profit, because the second factor mentioned at the beginning of this paper, namely, "the ability to produce quickly materials for which there is a demand" reaches its maximum in the moist regions of this island. The time element is the greatest drawback to forestry. The farther north one lives the longer one must wait. The farther north, the fewer the resources and the smaller the population, until of course a point is reached where nothing can grow and no man can live. Not only do trees grow much more quickly in the South, but the number of species is larger. They may not grow on the whole much faster than trees of temperate climes, but they grow longer. Except for a few weeks each year the growth is constant. Waiting 200 years for a Spruce tree is not only discouraging to the private planter, but simply out of the question. The demand for Spruce may cease altogether in that length of time. A nation may rise and fall in a couple of centuries. Machinery and

methods of manufacture may change completely. How different the conditions in a warm climate where Eucalyptus trees, for instance, reach the height of one hundred feet in ten years! For the greatest amount of profit we should plant not only quick growers, but plant in regions where the quick growers grow quickest.

We should also, it seems to me, consider silvicultural qualities first in the choice of species. By silvicultural qualities I mean rapidity of growth, ease of propagation, and freedom from disease. These are often much more important than the quality of the wood. Twenty years hence we shall not be so particular about the kinds of woods we use. It is wood we want, and if defective, defects may be remedied. In these days of antiseptics there is no more reason for rot in wood than for gangrene in wounds. Good and bad woods are only comparative terms, and I find that in countries where wood is scarce there is much less fashion and fastidiousness in reference to kinds. Owing to the fact that trees grow with great rapidity along our Eastern Coast from New York southward, it seems to be a hopeful region for the development of forest farms such as already practically exist on the Eastern Shore of Virginia, where the pine leaves are highly valued as manure in the cultivation of the sweet potato. Of all this southern region, however, Cuba offers the greatest advantages because of her lack of wood, of her need of it, of the great variety of useful woods which will grow there, and because of the rapidity with which, owing to the climate and fertility of the soil, they will grow.

Frost is always a menace to both forestry and agriculture. One is not absolutely free from it until he reaches the latitude of Cuba. The slightest touch of it is fatal to many valuable plants, so in order to be safe it is best to go well south when you go south. The orange growers of Florida have learned this from several very frosty experiences.

We ordinarily under-rate Cuba, especially her size. Many New Yorkers compare her with Long Island. Long Island

however is only a little larger than the Isle of Pines, which is a very small and unknown part of Cuba. Although it is a separate island I call it a part of Cuba because it belongs to the Department of Havana. The Isle of Pines alone is 160 square miles larger than the state of Rhode Island. Cuba is as large as the State of New York. It is almost four times as large as Holland and three times as large as Switzerland. It is 730 miles long and from 90 to 20 miles wide and contains over 45,000 square miles. The English island of Barbadoes contains only 166 square miles and supports a population of 170,000, almost 1,000 per square mile. If Cuba is capable of supporting only half that number she will hold over 20,000,000 of people. Java is only a little larger than Cuba. It supports 20,000,000 and is still under-populated, although more densely peopled than Belgium. Cuba is in need of people of the white race—people from Southern Europe. Prosperity in the Tropics is dependent upon workers. They must exist in proportion to the natural resources of the country. The great influx of peasants from Spain is of great benefit to the island. The Portuguese are unexcelled workers in the Tropics. These people can stand an immense amount of heat, and can work in the tropical sun to much better advantage than the negro. The statements that the white man cannot live and be healthy in the Tropics is a great mistake. The condition of Cuba has been unsanitary, but the climate aside from man's interference is on the whole more healthful although not as varied and perhaps not as pleasant as a temperate climate. One must sweat in the Tropics to escape lethargy which leads to unhealthfulness. When the population becomes more dense, and nature less bounteous, men will have to work for the necessities of life. The general tone and healthfulness of the country will then be better. The statement that a high state of civilization cannot be reached in a tropical climate is contrary to the records of history and archaeology. The main difficulty to-day in the American Tropics is under-population and in conse-

quence a scarcity of labor. Planters were searching in vain for laborers in the tobacco fields last spring. Fortunately forestry requires a small amount of labor per acre in comparison with agriculture.

Cuba is well located. It is the largest of the Greater Antilles. It is near to the Mexican and American coast. It commands three important gate-ways, the straits of Florida, the Windward Passage, and the Yucatecan Channel. The construction of an inter-oceanic canal would add much to the importance of the island.

In riding through Cuba one is not very favorably impressed with the appearance of a large part of it. Cuba looks forlorn and devastated. Bloodshed and oppression have not affected her fertile soil. The deep rich red earth is resting, waiting for the influx of new blood and new ways. It responds to the slightest touch of cultivation. Its possibilities are indeed unknown and almost limitless. In addition to many native West Indian trees, there are many more in other tropical regions of the globe which might be profitably introduced. One of the greatest benefits ever conferred by Great Britain in her colonial work was the introduction of seeds of many trees from the East Indies into her West Indian possessions.

I have no doubt also that many of our northern species will grow well in Cuba. In fact it is more than likely that several of our northern tree species will not only grow but grow better than in their native land. The Poplars, Chestnut, Locust, Walnut, Willows and other trees of other countries may flourish in its fertile soil. They will grow in southern Italy. Why not in Cuba? In fact Cuba is peculiar in this respect. Northern crops such as potatoes grow well by the side of pine-apples and other tropical products. Here is an excellent field for experimentation. For this purpose a botanical garden and experimental station are necessary. The sooner the better, for every year means much to the prosperity of this island. In this respect we should emulate the Dutch in Java and the English in India and Jamaica.

I say "we" because I believe and hope at least that American influence has come

to stay in Cuba. It matters little to a work of this kind whether the island is absolutely independent, under our protection in the form of a protectorate, or annexed to this country. The people of the United States and especially the people who have charge of affairs, also the better element of Cubans and the other foreigners who have interests in the island have fully determined that henceforth it must be healthful and peaceful. Even if the country becomes absolutely independent, American influence will be paramount and we should always under all circumstances be willing to lend a helping hand to aid the Cubans to bring their island to the highest pitch of productiveness. In no way could we better foster this work than by aiding in the establishment of an economic Botanical Garden similar to the famous Buitenzorg of Java and the Hope Gardens and Plantations of Jamaica. We could well afford to do this not so much for Cuba as for ourselves. The Tropics are biological headquarters. It is there where growth is most intense and where many physiological problems may be most easily solved. The study of vegetation for instance in a country where cold does not exist may render clearer the important question of frost. It is often in studying the condition of a country in which an evil does not exist that its cause and cure may be more easily understood. It would be an excellent place for northern botanists to go for a few weeks or months, just as Buitenzorg has been for many years the Mecca of European botanists. So important in fact has a visit to Buitenzorg been regarded that at least two European governments have aided botanists financially in order that they might study there. Its effects may be seen in the writings of Goebel, Schimper, Haberlandt and others. The importance of marine biological laboratories such as Naples, has long been recognized and at one time the construction of a similar establishment in Jamaica or the Bahamas was seriously considered. In Cuba there is also an excellent opportunity in the coral islands near Batabano and the Isle of Pines, which is only a short distance from Havana. It might be pos-

sible to combine these enterprises under the direction of one or several of our universities. Such a cause has the right to expect liberal financial aid from both this and the Cuban governments.

In the agricultural college in Wageningen in Holland there is a department of forestry. The students there are being trained not so much for work in Holland as in Java, where they are needed in the Teak forests. Much of the wealth of Holland was not made from cheese, but from the chocolate, coffee, spices and tobacco of the Indies. The same may be said of the English and the forestry school at Cooper's Hill. One need not visit Java to see work of this kind. It is in progress in Jamaica, which, on a clear day, is visible from the mountain peaks of Cuba. There one may see many interesting experiments with trees and plants from all parts of the world. We must not fail to bear in mind that an institution of this kind, even if conducted at great expense, pays for itself many times over if it simply introduces a profitable crop into the country, or even improves the quality of a native crop. The institution which produces a variety of cane for instance which yields a small degree more of sugar adds in the aggregate much to the productiveness of a country such as Cuba. The Gardens of Jamaica not only introduce new species and varieties for experiment but distribute young plants gratis or at cost price throughout the island to enterprising farmers. The plantation of Cinchona and Eucalyptus trees in the Blue Mountains are examples of its industry.

Then again much can be done in experimenting in reference to the growing of the crop. Owing to the inconvenient time element in the production of rubber and camphor, experiments are in progress to determine whether these trees cannot be grown as field crops. The seeds are sown and the young plants harvested, and from these the juices are extracted by special machinery. Perhaps some day our paper pulp may be produced in the same way. In a southern climate a field of Poplars or Willows, two years old would produce a large quantity of pulp.

In the tropics agriculture and forestry blend. Shelter trees are necessary. In several instances the planter strives to grow his crops under forest conditions. Chocolate, coffee, pimento, etc., grow better in the shade of other trees. Often such crops are planted in the virgin forest from which the underbrush has been cut. Shelter trees are necessary to protect tender crops from the fierceness of the sun, the gales and heavy down-pours of rain. They protect and enrich the soil and produce the forest condition such as these trees enjoy in their wild state. When northern crops are grown in Cuba they must be sheltered, and almost all northern species when brought to the South, although they may need all the sunshine they can get in the North, grow well in the shade.

Perhaps the best system of general culture for Cuba would be the kind in use in Italy. Although a very small portion of Italy is forested it appears covered with trees, except in the mountainous districts where they are most needed. There are no broad fields. All cultivation is done between rows of trees which serve for shelter and at the same time yield nuts, fruits, olives, willow-withes, fodder, props for vines, fuel and boards.

The tropical forest is very unlike the northern woods. It is in fact often disappointing. It is more irregular in form and the light is a dazzling reflected kind quite unlike the mild transmitted light of northern woods. This is, however, not always so. There is a sharper struggle for light and space, and weeds are more vigorous and pestiferous. There is enormous vegetative activity. There is a lack of periodicity of leaf-fall and a lack of protective adaptations against cold.

Owing to the lack of proper means of communication in Cuba there is a lack of wood in certain districts especially in the tobacco and sugar regions. It is not my

intention in this connection to more than mention the possibilities in the line of rubber, gums, dyes, medicines, chocolate, precious woods, spices and other forest products. It is my intention simply to emphasize the demand for fuel wood, charcoal, tobacco poles and fence materials, and to express the opinion that they may be planted with profit in Cuba.

Wood is used to a certain extent by the locomotives and industrial establishments in Cuba, but charcoal, the fuel par excellence for tropical countries, is most in demand for house use. It does not necessitate the use of a stove or the construction



A FOREST SCENE IN CUBA.

of chimneys. A brazier is all that is necessary. Were it not so bulky in proportion to its weight and fuel value it would no doubt pay to export it.

I am convinced that certain species of Eucalyptus will grow with magical rapidity in Cuba and in a surprisingly short time produce poles which will be fit for charcoal and for racks on which to cure tobacco. Another great good may at the same time be accomplished by planting

this tree in the malarial districts. There seems to be little reason for doubting its efficiency in improving the healthfulness of these districts, although it is often disputed. Just what it does is not known but it has without doubt improved the condition of several tropical countries in which it has been planted for this purpose. In the light of modern discoveries as to the cause of malaria, and the manner of its transmission, the Eucalyptus probably has no direct effect. It seems that a special genus of mosquitoes carry the protozoa of malaria from the water to the individual. The Eucalyptus probably accomplishes its good work by sucking the water out of the soil and thus depriving the mosquito and the malarial parasite of their breeding place. The amount of water transpired by these trees is immense, in fact in calcareous soils where drainage is difficult owing to pockets in the rock, it is the easiest and most efficient method.

Cuba is a great cattle country, and there is a great demand in consequence for fence materials. The fences which now exist consist mainly of barbed wire, propped up with all kinds of sticks and patched up with hedges of various kinds. Most of this was bought by the Spanish government for another purpose; it is doing good work at last, however, in aiding the cattle industry of the country. Good posts are needed, and no doubt many of the native woods are excellent for this purpose. The Logwood, which yields a valuable dye, is excellent for hedges. The Chestnut and Locust might be grown with profit for the purpose. The Locust might escape the borer in Cuba as in southern California.

Grass grows well in Cuba in the shade of trees, and the growing of trees, especially the Eucalyptus, and cattle raising are not incompatible. The shade is of great benefit to the cattle, and after the trees have reached a few feet in height the cattle do little injury. The Eucalypts any way throw very little shade owing to the fact that their leaves are edge to the sun.

Cuba will soon need large quantities of crates, boxes and baskets. These can be

much more profitably imported in the knockdown from this country, except the cigar box, for which the West Indian Cedar (*Credrela odorata*) is the wood of woods. Cedar and Mahogany are near relatives. Both belong to the order Meliaceæ, which is a group of broad-leaved, quick-growing trees. I hope for the time when these trees may be systematically planted in Cuba. In Jamaica this Cedar is dotted over pastures and along water-courses. It grows to a large size and produces a handsome durable wood which has been extensively used for furniture, shingles and ornamental work. Cuban Cedar is extensively used in this country in the manufacture of high grade boats. The Mahogany proper is the wood of all woods, and can be easily grown in Cuba.

Conifers are not common in the Tropics. This is no great disadvantage. From a silvicultural standpoint, especially as far as the soil is concerned, there is little reason for the encouragement of conifers where quick-growing broad-leaved species will grow. In certain parts of Cuba, especially Pinar del Rio and the Isle of Pines, *Pinus Cubensis* is common. It usually grows in the poorest soils. It may be found on dry obsidian ridges in Guatemala and Honduras and on coral rock in the Bahamas, where it was formerly known by *Pinus Bahamensis*. Pines are usually not common in tropical climes, although there are several species such as *Pinus Pinea* which cannot endure a little cold. No doubt there are several species of conifers which will grow well in Cuba. Their scarcity in tropical countries is probably not because they do not like the climate, but because they are overwhelmed and crowded out by broad-leaved kinds. There are, however, near relatives of the Pines which thrive in the Tropics and produce excellent woods such as the Podocarpus.

It seems strange that some of the slowest growing and hardest woods of the world are produced in the tropical climates: *Lignumvitæ* for instance, which is extensively shipped from Cuba. Close by their side may be found, however, rapid growers. The truth is that there are rapid and fast-growing kinds in al-

most all parts of the world. Slow growing or fast growing seems to be, to a certain extent at least, an inherent specific quality. The rate of growth may be slightly changed by changing the environment, but ordinarily a slow grower is a slow grower even under the most favorable conditions. There are in Cuba a large proportion of rapid growers, quite as many I believe in proportion to the number of species as exist in temperate climates.

The soil of Cuba is fertile, her climate is good, and her location is excellent. As an instance of the productivity of the soil I might mention that cane once properly planted is good for twenty years. In Louisiana it is planted almost every two or three years.

Her beauty and quaintness are equal to that of southern Spain and Morocco. The north shore, which is the pleasantest part, is within seventy hours of New York City. The northern shore of Cuba will some day be the Riviera of America. The amount of material which has been produced in Cuba in times past is

immense. The surface of the soil has been merely scratched with imperfect ploughs. A large proportion of the land is level or rolling and easily cultivated. In addition there are vast mountainous regions capable of supporting magnificent forests. In the Tropics however it is more difficult to classify land than in the temperate regions. The choicest fruits are often produced in the unlikeliest spots. The soil is generally good. A soil which is barren in the North may be exceedingly productive in the Tropics. Humification is also much more rapid. Peat never accumulates owing to the rapidity of the decomposition of organic matter. This is due of course mainly to the climate but also to an abundant fauna of the soil which ventilates it, and thus hastens humification. What Cuba needs above all things is a botanic garden and forestal and agricultural experimental station to demonstrate her possibilities. Although no longer the brightest jewel in the crown of Isabella she is still the gem of the Antilles, the most promising island of the American Tropics.

FOREST LAW IN THE UNITED STATES.

(Continued from the July number.)

BY TREADWELL CLEVELAND, JR.

VI. THE ORIGIN OF THE DIVISION OF FORESTRY.

In following the course of the National timber laws we have somewhat anticipated events.

On August 15, 1876, there was approved an appropriation act by an amendment to which the Commissioner of Agriculture was authorized to "appoint a man of approved attainments and practically acquainted with the methods of statistical inquiry," who should report to that commissioner upon the salient facts regarding the forest conditions of this country and upon the example of foreign countries in forest work. Under this authority, Com-

missioner Frederick Watts appointed Dr. F. B. Hough.

This provision of law resulted from a meeting of the American Association for the Advancement of Science in 1873, which had appointed a committee to memorialize Congress, and which had presented a bill to both the forty-third and to the forty-fourth Congress without avail.

In 1881 the appointment, which till then had been continued from year to year, received for the first time a special appropriation, the appointee becoming the chief of an established administrative division in the United States Department of Agriculture—the Division of Forestry. Dr.

Hough, whose invaluable reports appeared in 1877, 1880 and 1882, was displaced as chief in 1883 by Mr. N. H. Egleston, who was followed in 1886 by Dr. B. E. Fernow. Mr. Gifford Pinchot, his successor and the present chief, was appointed in 1898.

Under Dr. Hough and Mr. Egleston the work of the Division of Forestry consisted for the most part of statistical inquiry and popular exposition. With Dr. Fernow began more scientific work, original investigation, and the dissemination of the results. Since Mr. Pinchot's assumption of office, coöperation with the lumbermen, with interested private owners of forests, with State forest officers, and with farmers needing woodlots for home wood supply or for agricultural help, has been the natural and very fruitful policy. All investigation of forest conditions, of wood properties, of the silvicultural characters of commercial species, turns upon the local need; for example, upon the sweeping exploitation of a particular region, the conspicuous recklessness of lumbering usage, the conservative sentiment of a group of the population, the value of protective forests for the maintenance of a stable water supply, or the injury or devastation caused by fire or by unregulated grazing. Since the first of this year, in response to a request of the Secretary of the Interior, the work of preparing working plans for the management of the National Forest Reserves has been most auspiciously begun and diligently prosecuted by the Division of Forestry.

VII. THE CREATION OF THE NATIONAL FOREST RESERVES.

It already appears that the Federal forest policy as represented in the national timber laws down to the year 1891 may be characterized as either reckless or unintelligent. The past thirty years have witnessed the introduction in Congress of countless measures aimed to improve the relation of the Government to its forest riches. But with the exception of the establishment of the Division of Forestry, without which, indeed, there could have been no promise of advance, nothing was accomplished till

1891. In that year a radical change of policy resulted from the strenuous educational campaign carried on by the American Forestry Association. That Association, in 1888, had presented a comprehensive bill which provided for the withdrawal from entry or sale of all public timber lands not fit for agricultural use, and for their administration under technical advice (S. 1476 and S. 1779, Fiftieth Congress, 1st Sess.). This bill received no action, and after being modified and presented again for several years, failed completely. In the Fifty-first Congress, however, under the emphatic influence of Secretary of the Interior John W. Noble, a section was added to an act entitled "An act to repeal the timber culture laws, and for other purposes," approved March 3, 1891. This section reads as follows:

"Sec. 24. That the President of the United States may, from time to time, set apart and reserve, in any State or Territory having public lands bearing forests, any part of the public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations, and the President shall, by public proclamation, declare the establishment of such reservations and the limit thereof."

With the authority thus conferred Presidents Cleveland and Harrison established 17,500,000 acres of forest reserves previous to the year 1894. In the case of these reserves the petitions of citizens suggested the areas, and examinations by the General Land Office followed; while the American Forestry Association acted as intermediary.

But invaluable as was the mere possession by the Federal Government of forest reserves over which it had implied control, that control could not be more than nominal—could not be adequate or effective—without the passage of legislation providing for a well-considered and thorough administration. Without real protection a reserved forest is not and cannot be safe. Nor is a lawless adjacent population the only danger that may threaten it. The mere existence of such a no-man's-land in the midst of human settlement and human need and human carelessness, acts as a

temptation to even the honest citizen; invites fires that steal past the fallows on which they were kindled; offers the herdsman a convenient pasturage; restrains no loggers who trespass, perhaps inadvertently, upon lands which no person and no visible boundary claims as public property.

The American Forestry Association had for several years made every effort to secure the passage of a law devised for the administration of the reserves, and, in the House, the measure was specially urged by Representative McRae, chairman of the Public Lands Committee, but without success, though in the Fifty-third Congress it was passed by both houses, but failed in conference. It was then—in 1896—that Secretary Hoke Smith, of the Department of the Interior, who perceived the need of a proper system for the care of the public forests, both within and without the reserves, requested the National Academy of Sciences to investigate and report "upon the inauguration of a rational forest policy for the forest lands for the United States."

In response to this request the Academy submitted to Secretary Francis, February 1, 1897, a preliminary report recommending the creation of thirteen additional forest reserves with a total area of over 21,000,000 acres, and on February 22, 1897, these reserves were proclaimed by the President.

The wording of the proclamation gave a false impression of the purposes for which the reserves were created. Many supposed that the lands would be withdrawn altogether from use and development; and others, from various motives, some of which were far from creditable, took care to encourage that supposition. Much bad feeling broke out in Congress in consequence, and as no steps were taken to correct the false impression, while those opposing the reserves had personal ends to serve, the enemies of the cause triumphed by securing a provision of law which suspended the proclamations of the new reserves, except in the State of California, till March 1, 1898. Before the expiration of this term, a truer notion of the reserve policy had won the West to its hearty support, and a further official

study of the reserves had served to confirm their desirability, so that all attempts to prolong their suspension proved in vain and, with a few immaterial alterations of boundary, they were accordingly established. From this time forth the Federal Forest Reserve policy has remained unquestioned by any considerable element of population: it has become an integral part of our National policy.

VIII. THE THREE OFFICES FOR FOREST WORK.

We have seen that since 1855 the Department of the Interior, through the Commissioner of the General Land Office, has had the custody and control of the public timber lands, which have thus been loosely classified with the unforested public lands. The administration of the reserves thus falls to the Secretary of the Interior, who is authorized by the law of June 4, 1897, to make rules and regulations in harmony with the principles laid down in that law. The same law intrusted to the U. S. Geological Survey the work of mapping and examining the reserves, while later legislation has extended the area of these examinations to the regions adjacent to the existing reserves, and to any other areas which might be reserved. Meanwhile, the Division of Forestry, in the Department of Agriculture, performs all the scientific forest work of the Government, and has recently begun the preparation of working plans for the harvesting and disposal of timber upon the reserves.

The New York *Evening Post* in an editorial recently quoted in these pages, has already alluded to this division of authority as "a most ragged piece of patchwork." Certainly there is no rational basis for the arrangement; it is the outgrowth of unorganized efforts made without any sort of anticipation of present urgent needs. True the work of the Geological Survey in connection with the reserves, which is carried on in hearty sympathy with the aims of the Division of Forestry, is now about half completed, so that the relation between these two offices is obviously but temporary. But the separate activity of the General Land Office, in its work of admin-

istering the public forest lands, both reserved and unreserved, may well continue indefinitely, unless law intervenes to unite the powers of that office with those of the Division of Forestry, either under the Department of Agriculture or under the Department of the Interior. "Tis a consummation devoutly to be wished." A clearer understanding of what forest work is and should be, the favorable attitude of Congress showed in its increased appropria-

tions for the current year, and the vast and widening field for forestry throughout the country, all point directly to a radical reorganization of the offices now charged with forest work. Till that reorganization has been made all effort in the right direction is hampered and in part nullified by checks and hindrances which are as easy of legislative removal as they are opposed to reason and common sense.

(To be continued.)

THE YALE FOREST SCHOOL BUILDING.

The photographs, reproduced on the opposite page, show the building which will be used for the Yale Forest School. The property was left to the University by the late Professor O. C. Marsh, who wished it to be used for a botanical garden. Inasmuch as the funds of the University do not permit the establishment of such a garden, the estate will be devoted for the present to the uses of the Forest School.

The house is admirably adapted for the purposes of instruction. A large entrance hall on the first floor will be used for a general assembly room, and the other rooms on this floor will be converted into offices and recitation rooms. On the second floor there will be a laboratory, a library, and an herbarium room. The museum specimens will be placed at first

about the assembly room, until the material collected justifies the use of a separate room for this purpose.

Surrounding the house there are ten acres of land, on which have been planted a large variety of trees and shrubs. A certain amount of planting will be done on the grounds for arboretum purposes, and a forest nursery will also be established. The material from this nursery will, however, eventually be planted on the tract at the outskirts of New Haven which will be used for the chief practical forest work of the students while they are in New Haven.

There are two greenhouses on the place which will be maintained in view of their probable use in connection with the botanical garden.

THE LAST REPORTS ON THE FOREST RESERVES.

Part V. of the Geological Survey's 20th Annual Report* contains a great deal of information about the general condition of ten of the national reserves, in which

* Twentieth Annual report of the U. S. Geological Survey. Part V. Forest Reserves; Henry Gannett, Chief of Division. Reports by Henry Gannett, John G. Jack, George B. Sudworth, H. B. Ayres, and John B. Leiberg.

For a review of Part V. of the Nineteenth Report, the first report on the Forest Reserves, see THE FORESTER for March, 1900 (VI., 3, 55).

foresters, botanists and everyone can be interested. Besides this there is much material relating to the climate and topography of the reserves, and to the varieties of trees to be found in them, their distribution, etc., for all of which those who are interested in it will go to the complete text. The most impressive thing about the parts of these reports which will be of interest to the general reader, is the clearness with which they show that these reserves, which have been set apart for



THE VALE FOREST SCHOOL.

the future good of the country by as statesmanlike acts as any that have marked the history of the last decade, can be saved from deterioration and brought to the point of greatest usefulness only by prompt and efficient care and protection.

The reserves of which the examinations are reported are the San Gabriel, San Bernardino, and San Jacinto reserves of southern California, the Flathead reserve of Montana, the Bitterroot reserve of Montana and Idaho, and the five reserves of Colorado known as the Pikes Peak, Plum Creek, South Platte Battlement Mesa, and White River Plateau Timber reserves. But although these are only ten of the thirty-five tracts already set apart in the West, the fact that the conditions which exist in them prevail over the whole Rocky Mountain region and that of southern California give to the reports a wide interest and significance.

Of the 17,000 square miles which these reserves contain much the same general statements can be made. The land is all, either because of altitude, or roughness, or poverty of soil, unfit for agriculture; grazing can be carried on profitably on only a limited number of acres and mining seems to have met with small success. So that it may be said justly that the value of the reserves depends almost wholly on their forests. Yet these are now practically lacking in many places, and but a comparatively small part of the area supports timber that has commercial importance. This state of things is not due to any such cause as the climate, but almost wholly to the effects of timber-stealing, and of the fires which have been burning all through the Rocky Mountain region for centuries, and which are now, if anything, more frequent and destructive than ever before.

Some of the papers which make up the fifth part of the Twentieth Report are better described as surveys of the land and what is on it than as examinations of the reserves and the conditions which are affecting their history. In these reports a good deal of information about the causes of fires, the extent of damage done by them, and the relations of settlers, grazers,

hunters and others, to the welfare of the reserve can be gathered between the lines and from brief specific statements. In others, however, notably in two by Mr. George B. Sudworth, the economic and social conditions to which the administration of the reserves will have to be adapted are more fully considered. These, as also others though with less clearness, show that the destruction of the forest which is now going on is almost entirely due to human malice or carelessness. Avalanches and land slides destroy some trees; occasional fires are started by lightning; insects and fungi are also ever-threatening enemies of a forest. But were man excluded from the reserve these enemies of the trees would do comparatively little harm.

The fires that are now so common are due first of all to the carelessness of thoughtless hunters and tourists—"tender-foot campers"—and of irresponsible herders. In his report on the White River reserve Mr. Sudworth says of this latter class, "They have no interest beyond their season's or month's wages, and the burning, through even their own carelessness, of a few hundred acres of reserve timber is of little moment to them. The writer saw a few such irresponsible herders light their pipes and afterwards throw the burning matches among dry grass and forest litter. Several incipient conflagrations from such sources were prevented, but through no effort of these herders. The common sentiment among this class is expressed in the following: 'Well, I guess Uncle Sam can stand the racket, if the whole shootin' match burns up!'"

After a fire is thus once started its history is that of most other fires. In case there is rain or snow it is apt to go out; but otherwise it smolders and burns slowly, perhaps burrowing into the soil and destroying the roots of the trees, sending up a small column of smoke which can often be watched for days from miles around, until finally it is fanned into fury by a wind, and blown across scores or maybe hundreds of acres. Often valuable timber is thus destroyed, but where the growth is still young the damage though

at first sight less may after all be much greater. For it may mean that as no trees are old enough to leave seeds behind them, the possibility of future growth is indefinitely postponed. Of the Battlement Mesa reserve Mr. Sudworth says (page 236):

"This danger is a constant menace—to the thousands of seedling conifers which have slowly crept across so many blackened wastes. Their inflammable crowns are all within reach of even the lightest blaze that may run through the abundant grass of the region. If fire should enter, every vestige of promising forests would be swept from thousands of acres. The scanty reforestation which the last twenty or more years have effected in these regions could not be reproduced in fifty years. Each successive burning removes the elements of a possible return of original species by at least a score of years. The limit at which safe recovery can be expected from destruction by forest fires has been reached in this region. Greater inroads upon these depleted forests are sure to bring far-reaching effects to the vitally connected agricultural interests of this vast territory."

In another place (page 147) the way in which the ground fires burn, and the similarity in character between the second rate hunter and the ordinary herder are both shown in a paragraph of Mr. Sudworth's report:

"In September a small fire, covering about one-fourth of an acre, was discovered by me on the north bank of the South Fork of White River, about twenty miles above its mouth. The river bank is 5 or 6 feet above the water at this point and the timber very dense, with a deep, dry humus and many buried, dry, half-decayed logs. A deep, almost smokeless, fire had felled a number of big green spruces by slowly burning off the roots, the fire being fed by the mass of inflammable matter in contact. Such fires are flameless. They are buried 12 to 16 inches below the tangled, mat-like surface cover of green plant roots. Here they eat into the punky buried wood and powdery humus in a line of living coals a foot deep and as broad. The heat is intense, soon converting big green roots into charcoal, which serves to feed the destructive advance of such fires. Several hours' digging exposed the fire, which was finally extinguished with many hatfuls of river water. It proved to be a neglected, long-smoldering camp fire, for besides the usual signs of a camp fire the perpetrators had, on leaving, obligingly left a record nailed to a tree, which is illustrative of their law-observing spirit in respect to game and fish:

'July 25, 1898.—This is to certify that we leve this mornin' with a lode of fish and deer meet.
Joel Barnes & Chas. Baird.'

It is lawful to kill deer in Colorado only from September 1 to October 15. Fisherman are allowed to carry off not more than 20 pounds of trout, the only fish in the region."

Fires of this kind result in the end in the 'parks' and tracts of Aspen and scrubby brush with which some of the reserves are now filled, and which are being seeded down to timber much less rapidly than the remaining groves are being burnt off. The waste and loss involved are clearly shown by Mr. Gannett who says of the above mentioned reserve in his introduction (page 7). "The timber upon this reserve is of exceedingly poor quality. The stand is everywhere very light, the trees are small, branched low down and knotty, and a considerable proportion, 25 % to 40 %, including all the largest timber, is dead or defective." Of the South Platte reserve he remarks, "Through fires and timber cutting nearly all the timber of value has been destroyed, and it will require generations of care and protection before this area can again become a source of supply."

In regard to cutting the reports show that but little timber is now taken away. But considering the manner in which the work is carried on, and the fact that it is usually accompanied or followed by burning, it is far too serious a menace to the welfare of the reserve to be brushed lightly aside. In some instances the lumbering operations are doubtless undertaken in ignorance of the boundaries of the reserves, but this does not lessen the harm that is actually done. The object is always to get out as much wood as possible as quickly as possible, and in the process all seed trees are usually cleared away, and young growth is broken, bent and slashed most destructively. When fire follows this sort of cutting the ruin of the forest is complete. Sometimes, however, it precedes it, for the mill operators are apparently given to firing desirable blocks of wood at a time of year when there is no danger of more than the bark and lower branches being scorched. "It is said that these parties then cut the fire-killed timber with a feeling that they are committing a less culpable theft than if cutting green timber.

Moreover if caught by timber agents, the stumpage claimed is less for 'dead' than for green timber."*

As public sentiment is always an important factor in enforcing the law it is interesting to note that though the poorer class of settlers sees nothing to respect in the reserves, the mill operators who are responsible for all the depredations of any magnitude are quite sensible of the nature of their undertakings. A couple of quotations will make this clearer than could any but a long explanation. On page 143 the author of the report on the White River reserve says:

"Strangely enough, nearly all illicit lumbering and other timber depredations are looked upon by the settlers as blameless ventures. Such operations furnish a limited amount of employment to the poorer classes, and but for occasional sore enmities toward the richer mill operators, the latter are held in the light of benefactors. Indeed, by very many, they are considered to be taking only what rightfully belongs alike to them and all other settlers. The depredator's good name is not thought to be sullied by the veritable theft of timber from the national domain. The spirit of some landless settlers of the poorer class is well illustrated in the following remark made to the writer by a party suspected of stealing dead building logs: 'This timber belongs to us settlers and we're going to get it! The Government officials can't prevent us, either, with an army! If they attempt to stop us, we'll burn the whole region up.'"

On the next page we read, however, that:

"Notwithstanding this moral acquiescence, it is observable that the mill operators resort to various shrewd protective tactics. Almost no sawed timber is left at the mill or anywhere on the reserve. Often the lumber is drawn as fast as it is cut to some point just beyond the boundary of the reserve, whence it is disposed of with less danger of implication. Again, if pounced upon by 'timber agents' it is held to be less criminal to have dead logs on the mill yard than green. The haul of green and dead logs from the forest to the mill yard is, therefore, arranged so that all the green timber is conveniently run through the mill first.

* One of the speakers at the recent meeting of the American Forestry Association in New York reported that this method of increasing the supply of convenient and valuable "dead and down" timber is also being practiced in Minnesota.

"Operators are watchful and suspicious of all strangers. My unexpected arrival in the region of the Coal Creek mill resulted in stopping all cutting, sawing and skidding, and within twelve hours 17 teams were at work hauling away timber accumulated at the mill."

This is encouraging. It shows that though the members of one class of the reserves' enemies, the lumber thieves, are willing to rely on the settlers for support, they do not also accept ideas of their "rights" from their employees, and are already alive to the nature of their guilt and its possible consequences.

Much more could be said about these reports, and a great deal also about Mr. Henry Gannett's second paper on the "Forests of Washington" which begins the volume. But many pages are filled with material which, however, important and valuable, will be interesting to only a few; and enough remarks and quotations have already been made from what remains to indicate what the reports and papers show about the general condition the reserves are now in. This condition is typical of thousands of square miles in the mountain regions of the West, and is as bad as it is simply because the people who make laws and those who enforce them, do not realize or do not care. Parts at least of these reports should be read by every congressman and member of a State legislature.

In the *Conservative* (Nebraska City) for July 26th appears a letter from Mr. C. D. Robinson, of Pawnee City, about the profits from a 40-acre plantation of Catalpa and Osage established in 1890. The trees when set out were one year old. The Editor of the *Conservative* reviews the letter thus: "Estimating the forty-acre tract to be worth \$2,000, the labor cost \$1,000, the total investment would be \$3,000. The market value of the 200,000 posts is \$20,000. This is what Mr. Robinson may sell his posts for and still have his land and the stumps from which to grow more posts and the second growth would mature in about ten or twelve years. The return on the investment is about 45 per cent. simple interest.

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Vol. VI.

AUGUST, 1900.

No. 8.

Changes in the
Forest Division.

The appointment of Mr. Henry S. Graves as Professor of Forestry in the Yale Forest School, and of Prof. J. W. Toumey as his assistant, has deprived the Division of Forestry of the Agricultural Department of two of its heads of sections. Professor Graves has been in charge of the Section of Working Plans since its inauguration, and Professor Toumey has been Superintendent of Tree Planting since his connection with the Division. Under the administration of Mr. Graves the Section of Working Plans has furnished the larger portion of the rapid growth which has characterized the Division of Forestry in the last two years. Beginning with a comparatively small area, the applications for working plans under the coöperative scheme of his section have now extended to approximately 50,000,000 acres, including all of the National Forest Reserves, the whole of the Forest Preserve of the State of New York in the Adirondacks and Catskills, and about 2,000,000 acres of private lands. Under Professor Toumey's administration the Section of Tree Planting, organized on a similar coöperative basis, has had very marked success, and is now thoroughly established in a career of special usefulness.

It is greatly to the credit of both of these gentlemen that the organizations

which they have conducted and which they are about to leave have been so firmly established under them that the work will suffer no interruption by their departure. Mr. Graves' place as Superintendent of Working Plans and Assistant Chief will be taken by Mr. Overton W. Price of the Division. Before entering the Division Mr. Price had an exceptionally thorough training as a forester. After graduating from the University of Virginia, he studied for a while at Biltmore, N. C., and thus was at the great advantage of having had practical experience in this country before he went abroad. In Europe he spent nearly three years, chiefly in Switzerland and Germany, where he worked under Sir Dietrich Brandis, formerly Director of the British Forest service in India. He also studied for a while at Munich. He entered the Division of Forestry a year ago. The position of Superintendent of Tree Planting has yet to be filled.

The contribution of Professors Graves and Toumey to the progress of forestry in the United States through the Yale Forest School will be not less conspicuously useful than it has been while they were members of the Division of Forestry.

Reserves and the
American
Lumberman.

In its issue of July
7, the *American Lum-
berman* took occasion

to publish the following editorial: "If a plan of any forest reserve or government park that is timbered in whole or in part contemplates the non-utilization of the timber it is a mistaken one, for natural resources should not go to waste as timber will if not cared for and marketed in season. But if the timber is handled as a commercial proposition and judiciously put on the market in fair competition there can be little or no objection to the incorporating of almost any quantity of timber owned by the government into a reserve."

The truth of this is undeniable, but it is also denied, and one wonders for whose edification the *Lumberman* saw fit to give it space. It is sad to find a lumber journal, which in importance is second to none in

this country, betraying at this late date such seeming ignorance of the nature of forestry, of the objects for which seventy-two thousand square miles have been set aside as forest reserves, and of the real problems which complicate their management. These problems are many and, whether simple or difficult, are of pressing importance. The *American Lumberman* could do more good by discussing them, and by informing its readers about them, than by spending its time in groping among the old and well-settled foundations of the whole reserve system.

**The Important
Work of the
Fire Warden.**

The report of Colonel Fox, the Superintendent of Forests of New York State, for 1897 appears in time to emphasize the importance of one of the duties which devolves on the newly created Chief Fire Warden—that of bringing those who start forest fires to justice. In New York, as everywhere else, the great difficulty has hitherto been that of making the laws which were provided for the punishment of these offenders effective. The local warden who believes that the well-meaning neighbor, or perhaps even friend, who started the fire through criminal negligence will be more careful in the future, has every temptation not to have a warrant sworn out. So he does his best to put out the fire and turns in a report of it with no indication of the cause. Of the 98 fires reported from October, 1896 to the end of the year 1898, the causes of only forty were given. And though, as Colonel Fox says, “the wardens may have been unable to ascertain the cause in some cases,” yet more often they knew the reason and though their attention was repeatedly called to their failure to make proper reports, “refrained from stating it to avoid trouble with the neighbors.” Not only this, but no one who looks over the reports can fail to notice that of the forty out of ninety-eight fires of which the origin is set down, only a few were started in such a way that neighbors could be held responsible. It is largely sportsmen, locomotives, children, etc., that are blamed.

Indeed experience of fire laws in whatever part of the country they have been passed, and of game laws also, has shown that local wardens cannot be counted on to have offenders prosecuted. Some one is needed who, with no special interests in the locality, can investigate the source of each fire on the scene, and see that the law is enforced. If this is not done the educational value of the law is lost; but when a competent person is appointed to give this business full time and attention, the best and much needed results can be hoped for.

**Preventable Fires
and their
Toleration.**

At the New York meeting of the American Forestry Association in June, Colonel Wm. F. Fox related some very interesting facts about the fires that occurred in New York State during the year 1899, which are also illustrative of the experience of Maine and other States where similar conditions exist. The drouth during the summer of that year was greater than any that had occurred for many seasons, and the forest was so dry that a spark could start a fire anywhere. In all 322 fires were recorded—ten times as many as have occurred in any other of the fifteen years during which the Forest Commission has been in existence. But though conditions were so favorable and fires so common, Col. Fox stated that in the two million acres, more or less, of forest land owned by private individuals and clubs, there was only one fire. The 321 others were all on the one million owned by the State. The reason for this was simply that private lands, especially those which belonged to the clubs and over which guides were constantly going and coming, were patroled thoroughly and efficiently. All burning was not merely checked but prevented, and this through no such thorough supervision of the forest as would be possible on private estates and in club preserves but out of the question as an undertaking for the State. For the lands which are held by the pulp companies and managed solely for the money that may be got out of them are among the private holdings referred to above; and the cost to the State of fighting

the fires which broke out on its lands, and the damage done by these fires, far outweigh the greatest possible cost of preventative forest supervision. The case shows that forest fires are no longer to be looked on as necessary evils in New York, but as needless disasters.

When this is so important and so plainly demonstrated, what must one think of "a large owner of New York Timber Lands," who lets himself be reported in the *New York Tribune* (July 8th) as saying: "Most of us are simply sitting in our offices waiting for the danger season to pass, each one hoping that his particular lands will escape the fiend." Fifteen years ago this statement could have been made on every hand and no one could have challenged its reasonableness; but to-day the man who makes it shows, if correctly reported, that he travels in an old rut and is content with the foresight of the last generation. Not only for their own sakes but for the good of the country, it is time that those who control its forest lands should wake up to the meaning of the lessons which the experience of forest commissions like that of New York are teaching them.

The New York
Meeting and
Press Comments.

York during June, showed, as few things have done for a long time, how widely the interest in forestry and the preservation of our forest resources has spread. This was made clear, partly by the papers read at the meeting and by the corre-

The meeting of the
American Forestry
Association in New

spondence incident to it, but most strikingly by the notices in the newspapers. While the meeting was going on three-fourths of the two columns which the New York dailies usually gave to the sessions of the Association for the Advancement of Science and its affiliated societies, were devoted to the meetings of the Forestry Association. Furthermore, during the week of June 25th, and also during the three weeks that followed, special articles of greater or less length, summarizing in some way the results of the meeting, or giving apropos thereof information about one thing or another allied in interest to it, appeared in almost all the New York papers and in many of the leading journals and reviews throughout the United States. In a number of cases the meeting was reported as far west even as California.

In some instances these reports and notices had in them an element of the amusing. Some editors in out-of-the-way places seem to have got wind of the meeting only about a fortnight or more after it was over. These appear to have felt vaguely that forestry was a good thing in which their readers were doubtless interested, and to have done their best accordingly. Often the notices which they brought forth were scanty; sometimes they said that the meeting had begun as much as ten days after it had adjourned; frequently they alluded hurriedly to its proceedings with nothings of most respectful brevity. But still the reports appeared; and with all due allowance for the fact that the journalistic world at large makes news of all things, they showed that the interest in forestry is spreading.

NEWS, NOTES AND COMMENT.

News from
New York.

Mr. L. M. Emmons, of Oneonta, N. Y., has been appointed Chief Fire Warden, pursuant to the provisions of the law passed last winter. His duties will consist principally in maintaining a systematic and efficient organization of the

large number of town fire wardens throughout the Adirondack and Catskill regions. When vacancies occur among these officials, it will be the duty of the Chief Fire Warden to recommend to the Forest Commission suitable persons for appointments to fill their places. One of the most im-

portant duties devolving upon him will be the prosecution of persons who start forest fires wilfully, negligently, or in violation of rules and regulations of the Commission.

Mr. Ralph C. Bryant, the first graduate of the State College of Forestry at Cornell, was recently appointed an Inspector or Assistant Forester, and, having passed the Civil Service examination satisfactorily, has been assigned by the Superintendent of Forests to Township 8, Herkimer County, where he will inspect the lumbering operations which are being carried on there, and see that the timber is cut in accordance with the terms of the contract. Although this township is owned by the State it was subject to a lumber contract at the time it was purchased by the Forest Preserve Board. Part of Inspector Bryant's duties will be to see that no trees are cut which are smaller than the diameter specified in the contract; and also to enforce certain other provisions relating to the trimming of the tops which are left by the jobbers after the logs are skidded—this trimming being necessary in order to lessen the danger from fire.

A forestry camp has been established on Township 40, Hamilton County, the tract on which Raquette Lake is situated. The party occupying it is under the charge of Mr. Ralph S. Hosmer, of the Forestry Division at Washington, and is busily engaged in making working-plans for lumbering the township, in accordance with the plan of coöperation between the Division of Forestry and the New York Fisheries, Forest and Game Commission which was described in the FORESTER for July. It is expected that these plans will be submitted to the Legislature for approval at its next session. There are eleven men in this camp, including the two recently appointed State Forest Inspectors, H. S. Meekham and Grant Bruce. With this party there are also Eugene S. Bruce and five student-assistants from the Division of Forestry. The camp is pleasantly situated on the shore of Raquette Lake, its white tents partly hidden by the trees. A tall flagstaff from which floats a large national flag, marks the location plainly.

The Forest Preserve Board is meeting each month either at Albany or at some place in the Adirondacks, and at each meeting extensive purchases of forest lands are made. As a result, the acreage of the State Forest Preserve is rapidly increasing. It is expected that another and a larger appropriation for the further extension of the Preserve will be made by the Legislature next winter.

**Lumbering, Drought,
and L diminished
Production.**

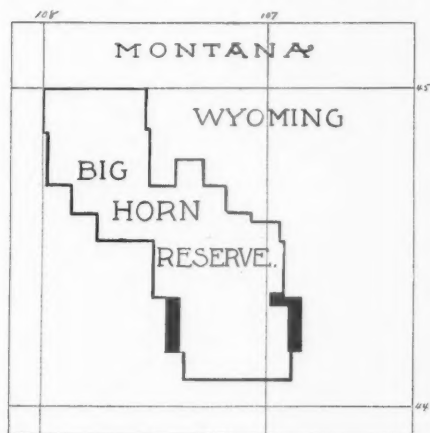
“While the present dry season is, as it were, an accidental circumstance, still the question of log driving is growing more important each year. The forests are being cut back steadily and more dependence is necessarily placed on the more distant and smaller streams. A drought which a few years ago would have been a temporary inconvenience only, to-day serves to hang up enormous drives of logs for an entire year.”—*Lumber Trade Journal*.

“Figures made public Thursday by the surveyor of logs for the Minneapolis (Minn.) district show a reduction of 50 per cent. in the production of White Pine lumber for June as compared with June, 1899. During the past month 312,948 logs were scaled, aggregating 24,292,230 feet, as against 520,129 logs aggregating 49,199,000 feet for the same month a year ago. This amounts to a reduction of a little over 49 per cent. and was due to the inability to float logs to the sorting gap, owing to the drouth and the low stage of water in the Mississippi River all through the month.”—*American Lumberman*, July 14.

**Additions to the Big
Horn Reserve.**

On June 29th President McKinley signed a proclamation which has added to the Big Horn Forest Reserve of Wyoming the areas indicated in heavy black in the accompanying map. This enlargement of the reserve brings within its boundaries a number of areas which are covered with timber, and also brings the limits of the reserve into better harmony with the topography of the country by ex-

tending them to the Rimrock at the edge of the plateau on which a good part of it



is situated. The addition contains 53,120 acres and brings the total area of the reserve up to 1,180,800 acres.

Growing Poplar.

"A few days ago I cut a Silver Poplar which had been planted for ornamental purposes in the spring of 1889, and which had grown nearly eighteen inches in diameter a foot above the ground, and probably contains a cord of wood. The tree became a nuisance where it stood, and so it had to come down. But it made me think of the possibilities of growing such trees for commercial purposes. Poplar is being much used for paper-making. How many years will it take at the present rate of using the native Poplars for this purpose alone before the natural supply will be exhausted? Possibly we may be able to find other materials for paper-making, such as corn-stalks, etc., but I would feel pretty safe to predict a ready sale of all Poplar wood that one could grow for the next one hundred years. I do not know what price paper-makers have to pay a cord for the wood they use. But think how quickly one could produce a big lot of Poplar wood. The tree grows marvelously fast. In ten

years from planting you would have quite a good forest, and even before that time much of the wood could be utilized for various purposes, as the trees could be set quite thickly at the start and gradually thinned out. Trees can be cheaply procured, too. I only offer this as a suggestion,"—*Farm and Fire Side*.

Forests and Stream-flow.

In a pamphlet recently issued by the Minnesota National Park and Forestry Association a number of pages are devoted to the need of preserving the forests in the region of the headwaters of the Mississippi in which it is proposed to establish the park. For emphasis a number of quotations from a collection bearing on the influence of forests on the water supply are reprinted, among which are the following:

It may be said that the measure of attention given to trees indicates the condition of the agriculture and civilization of a country.—*Mahe*.

It is not wars which have brought most evil on the region of the Mediterranean, but aridity, brought on and aggravated by the reckless destruction of woods, and by the excessive abuse of pasturing sheep on the mountains.—*Déherain*.

The clearing away of woods—in that lies the principal cause of the arrest to which agriculture has been subjected in Algeria.—*M. Calmels, Génie Civil*.

From Madrid to Jerusalem history and geography tell the same tale: forests given up to sheep, forests destroyed; mountains devoid of woods, mountains devoid of life.—*Broilliard, Les Massifs de Sapin et la disette de Bois en France*.

In the place of the fertile fields of cis-Atlantic Africa, we find now nothing but plains rendered sterile by desiccation and the absence of trees.—*A. Maury, Histoire des Grande Forest de la Gaule*.

In felling trees growing on the sides and summits of mountains, men under all climates prepare for subsequent generations two calamities at once—a lack of firewood, and a want of water.—*Humboldt*.

Now may be seen clearly whither tends this fatal connection of cause and effect which begins with the destruction of the forest, and ends in the miseries of the population: dooming thus the man to share the ruin of the soil which he has devastated.—*Surell.*

**The Coast
Redwoods.**

“Prof. C. S. Sargent of the Arnold Arboretum, Harvard University, has just written a letter to Mr. Edward T. Potter, a trustee of the Society for the Preservation of Scenic and Historic Places and Objects, calling attention to the danger threatening another class of great trees on the Pacific Coast. He says that there are two kinds of great trees in California, *Sequoia Wellingtonia*, or Big Tree of the western slopes of the Sierra Nevada and the Redwood of the coast. Assuming that the Sierra Sequoias will be saved, he continues:

“The future of the Redwoods of the coast gives cause for greater anxiety. This is a tree second in trunk diameter only to the Sierra Sequoia. It is a much taller tree, the tallest of all North American trees, and probably taller than any of the Australian Eucalypti, which have usually been considered the tallest trees in the world. To my mind, the Redwood is a more beautiful tree than the Mountain Sequoia, although I cannot get Mr. John Muir to agree to this, and it is economically more valuable. The Redwood extends, or did extend, in a maritime belt from the southern borders of Oregon southward to Monterey County, Calif. The whole of the land covered by this tree has been allowed to pass from the control of the Government, and a few years, fifty perhaps, will see the destruction of the original Redwood forests.

“Four years ago, when I was serving on a Government commission to study the western forests, I made a special trip through the Redwood belt in company with Gen. Abbott and Mr. Muir, in the hope of being able to find a tract belonging to the Government, but we were unable to find a single acre that had not passed from Government control. What

ought to be done for the credit of America and American civilization is to purchase, through act of Congress or by individual effort, a block of a few thousand acres of this forest with the idea of preserving it for all time. It is doubtful if the Government can be got to do this, but possibly some rich man or men can be found glad to immortalize themselves by saving from destruction one of the great marvels of the world, for this Redwood forest is the most stupendous and productive forest that exists. Unless a Redwood reservation is made, all trace of the original Redwood forest will disappear before the end of the next century.”—*New York Evening Post*, July 25.

**A Lumberman's
View.**

Under this title the Michigan Forestry Commission prints the following in a pamphlet entitled *A Little Talk About Michigan Forestry*:

“Mr. Edward Lowe, who is connected with a firm having large forest interests and carrying on lumbering in an extensive way, in a recent interview deplored the wasteful methods of lumbering and the total lack of thoughtfulness on the part of citizens and officials having in charge the affairs of the State. He has traveled extensively, and finds in no other country such an entire lack of thoughtfulness with regard to economical forestry as is displayed in this country and especially in our own State. He thinks the State cannot take hold of the matter of forestry too quickly and work out a plan that shall have in view the utilization of lands that are now entirely a waste, and by judicious management based upon the experience of other nations, create upon these same lands a legacy of wealth for future generations in our State. He would like to see lumbermen beginning to discuss more economical methods of manufacturing lumber, and conserving the young growth upon lands that are cut over. He believes there should be a united effort on the part of land owners and lumbermen to secure such legislation as will stimulate the investment of money in lands used for growing timber.”

Arrests in Pennsylvania.

"On Monday Geo. White, of Elimport, and William Welshans, of this city (Williamsport, Pa.), were arrested by Constable Mitchell and yesterday morning given a hearing before Alderman Kellenbach on a charge of starting a forest fire on land owned by David Stuempfle, of this city, with intent to destroy trees. The case against the men was worked up by Constable Mitchell, who has been made special detective by the County Commissioners, and the prosecution was carried on by District Attorney Kaupp.

The story of the affair is simple. In April the men were working for Stuempfle & Dunbar, sawing logs and the ring of a mall kept coming off so that they decided to make a fire and weld it on. The wind carried blazing leaves about and set fire to the trees and about nine acres of worthless timber was burned before it was extinguished. The two men worked with others to extinguish the fire and it was shown that they did not start it maliciously or intentionally.

The District Attorney insisted that they be held for court so that a jury might decide their guilt or innocence of criminal negligence. They were held in \$100 bail for court."—Williamsport *Gazette*, July 11th.

His Own Enemy.

"Were our lands held as permanent producers of lumber as they would prove themselves to be, such investments would be held at a lower rate of interest. The manufacturing plants would be built in a more permanent manner, there would be a greater incentive for the upbuilding of large, well arranged and well managed industries. Those in the business would have a greater incentive for the bestowing of their life work upon its details, there would be an *esprit de corps* among lumbermen that does not now exist, and which is not shared by his neighbors. Why should American lumbermen be held as robbers and ravagers by a certain class of people? They supply

the nation with material for homes, their industrial establishments and millions of dollars of exports. Without its forest revenues and the wages from the workmen engaged in forest industries, the country would be crippled. In the hundreds of half-deserted villages, whose idle dismantled lumber mills attest a once prosperous community, whose furnaces have been cold for many a day, the whirr of the saws forgotten, can be found the explanation. Forests that were intended as a source of supply for all coming generations, were stripped, ravished, to satisfy the greed of one generation and the all-devouring forest fire came to complete the devilish work. Lands that would have furnished timber supplies for ever are only areas of burnt stumps, worse than waste. Farms have succeeded in some places, but there are millions of acres that will never be profitably farmed. In his unthinking greed the lumberman accomplished his own ruin. Before he was aware extinction of timber stared him in the face. He moved his machinery to some distant place and began life anew, amid new friends and unravished timber. Each week we read in the press of some timber firm in the middle Northwest that has cut out of timber, and is seeking new fields for work. It is their own indictment. There is only one solution of the problem for American timber owners and that is that lands more valuable for timber growing than agricultural purposes should be so managed as to secure a constant future supply."—F. H. Lamb, "The Manufacture of timber on the Pacific Coast of North America" in *Timber and Wood-working Machinery*, London.

Not Single Trees but Forests.

"It is true, now that we have Arbor Day, and the children turn out here and there and plant a few trees, and the sentiment which is there inspired may bear fruit in time to come, yet the planting of an occasional tree along the highway or in the towns and cities is of no particular consequence. A few trees in Jerusalem or Antioch were as nothing compared to the destruction of

the mighty forest of Lebanon. The change in the face of nature caused by that action has permanently impoverished the entire region, the Judean valley was rendered arid, and Palestine to-day can support but few people because her water courses have been dried up and the great trees which sheltered the snows and kept the pitiless sun from reaching into the heart of the springs have been destroyed utterly, without a successor. Our need in the future shall be not so much a few trees about our homes, as great areas of trees all up and down this beautiful State, protecting head waters of our rivers, making use of our unfertile sands, giving variety and beauty to our gentle hills and refreshing the weary, whether human or otherwise, with nature's quiet cathedrals. Some time it may be, our State shall be so ruled by men of vision and men of taste—some time, it may be fondly hoped, our legislature shall have the leisure from the immense burdens of petty politics and the strident voice of the lobbyist and the crank to turn its attention to the State of Michigan—to renew its waste places with forest life—to make this peninsula, which is bound to shelter 10,000,000 of people, as beautiful as God intended it to be." From a sermon by Rev. D. F. Bradley, of Grand Rapids, quoted in the latest pamphlet of the Michigan Forestry Commission.

The Minnesota Park
and the
Mississippi.

"An allotment of \$2,250,000 has just been made for the improvement and deepening of the Mississippi River. A further amount of \$8,000,000 is asked from the River and Harbor Commission for rendering this river more navigable at certain shallow places.

"Now, at this river's headwaters in the northern part of Minnesota is an Indian reservation already ceded to the Government under the Rice Treaty with the Indians. This reservation is known as the Leech Lake Chippewa Reservation.

"In this tract are 830,000 acres, of which 200,000 are water. Within its boundaries are the three great lakes of Leech (with 540 miles of shore line), Winibigoshish

and Cass, besides seventy smaller lakes connecting with the infant Mississippi, making one great checkerboard of forest and water.

"It is said that upon this reservation is to-day the greatest body of White and Norway Pine to be found in this country. Conservative estimates give 2,000,000,000 feet of standing Pine, exclusive of some hard woods and Jack Pine, making altogether a great watershed and filter bed for the Mississippi River.

"Some prominent citizens of the Northwest are doing their utmost to have this land reserved as a National Forest Park by the Government instead of having it sold to the lumbermen.

"Upon this tract are tribes of Chippewa Indians numbering in all 1,500 souls. It is proposed that the Indians be left where they are instead of being driven away to a foreign reservation.

"The intelligent, thinking person must realize the effect upon the flow and quantity of the water in a river with its timber-covered headwaters denuded. A flood in the early spring and midsummer and low water for the rest of the year is the history of every stream after its headwaters have suffered at the hands of the lumbermen.

"The mean depth of the Mississippi would undoubtedly be greatly lowered were the timber to be cut from this great watershed. This being so, to keep the river navigable its entire length from St. Paul to the Gulf would require the expenditure of many millions annually. Instead of a request of eight or ten millions, a hundred millions would be asked for. To do that which would lower this great river two or three feet would prove a catastrophe to the whole Mississippi River Valley with its more than 30,000,000 inhabitants."—From a letter to the New York *Sun* by Charles Christodoro, of St. Paul.

Scarcity of White
Oak.

"A buyer of timber land who has been operating in the south country for two or three years past says the White Oak stumpage of that section is rapidly disappearing, and predicts

that quarter-sawed White Oak will be selling at \$75 to \$80 a thousand within the next five years. This may be a somewhat radical view, but it is a fact that the amount of oak stumpage in this country is much less than is commonly believed."—*American Lumberman*, July 21.

Forest Fires during
July.

During the past month forest fires, though much less common than a month ago, have been burning with greater or less destruction in all parts of the country. The following are a few of the many press accounts which have been received. They refer to only a few of many fires and are not selected because they are especially striking. Anybody who has read the papers will have seen more impressive articles. They are merely typical notices of the burning of woodland, a large part of it unrecorded, which is taking place in every State.

"A Despatch special from Kalispell, Mont., says: One of the worst forest fires ever known in northwestern Montana is now raging in the Swan Lake country, on the western part of the Lewis and Clarke forest reserve. The Indians set fire to the timber and are slaughtering the game. Within the space of thirty miles up and down the river there are over thirty fires now burning fiercely. As fast as one fire is extinguished another is set, and the rangers are almost worn out. The weather is very hot and dry, and the fires spread rapidly."—*Boston Transcript*, July 26.

"The forest fires which have been raging around Eldora for the past three days are still burning, and show no signs of immediate abatement, and unless a rain comes soon the loss, which is already great, will be simply tremendous. The loss already involves millions of dollars' worth of standing timber, and the Boulder Cañon region for an area of ten square miles has been changed from a virgin forest to a smouldering desert. The whole valley for miles is full of smoke, which mounts up in huge clouds above the highest mountains in the neighborhood, while at night the sky is painted with a lurid glow visible for miles.

"At Eldora the fire is reported under control and dying out, but it is admitted that a high wind from the southeast would rouse it to a fury of flame, and a spirit of uneasiness pervades the community. * * *

"The immediate cause of the fire has not been discovered, but it is said to have been due to the carelessness of the men at Caviness mill. * * *

"While the loss in buildings has not been so great as was feared, the destruction of timber will give a set-back to mining operations in that district for years to come, for the reason that the needed timber will be missing and it will have to be brought from long distances at a great outlay of trouble and expense."—*Post* (Denver, Col.), July 15.

"ANGELS CAMP, July 10.—A most destructive grass fire has been in progress a few miles from this place since Saturday noon. The damage it has wrought in one way and another is unestimated, but will amount well into the thousands. This is the first fire this season of any great importance, and has set wonderful object lessons on the necessity of guarding against such accidents. It is not known how the fire originated, but there is a possibility of it being the work of an incendiary. On Saturday the alarm was first sounded, and hardly had the work of extinguishing the first blaze begun before the wind turned and the fire swept from one hill to another, until Bear Mountain was one mass of flame and smoke. * * *

"On Sunday the fire broke away again, and with a roar like a distant cannonade started down the valley at the base of Bear Mountain. Men, wearied with their efforts and all-night vigils, rushed beyond to 'back fire' and try to turn the course but before they were aware of it a flame shot across Angels Creek and into the treetops on the opposite side, a distance of 300 or 400 feet. Almost immediately a cloud of blackest smoke rose into the air and could be plainly seen for miles around. All efforts to check the fire were in vain, and it swept on for four miles to the Stanislaus River, which it reached in two hours. Every effort is being made to keep it from jumping across the river, and men

are stationed on Bear Mountain to keep a close watch and sound the alarm in the event of the fire starting up again."—*San Francisco Call*, July 11.

"SANTA BARBARA.—What appears to be a big forest fire in the Mono district of the forest reservation is indicated by dense volumes of smoke rolling above the mountain tops. It appeared shortly before noon, and the forest supervisor left early this afternoon with a force of men to quell the flames."—*Los Angeles Times*, July 13.

"PHOENIX, Ariz., July 2.—Reports from eastern and southeastern Arizona state that forest fires have broken out afresh in many of the mountain ranges, and unless there is rain soon the loss in timber will be immense.

"For over a week a great fire has been raging on the Sierra Ancha, and is particularly visible from Globe. It has burned already a distance of twelve miles and over a strip from three to four miles wide, an area covered entirely by fine timber and affording range for hundreds of cattle. A fire in the Huachuaca Range has taken a fresh start and has driven out all the cattle and game. The military department at Fort Huachuaca will make an effort to stop the fire before it encroaches on the reservation."—*San Francisco Call*, July 3.

"H. G. Hamaker, supervisor of the Black Hills forest reserve, returned to Deadwood yesterday from Sand Creek, where he had been since Friday night, fighting the big timber fire that was burning there. He and his men put in a trying time for several days and nights, with no sleep, limited rations and unremitting toil. * * *

"Mr. Hamaker said it cost the government about \$200 to fight this fire. It had been burning a week or ten days before Mr. Hamaker was notified of it. There is no ranger in that section of the country yet, and the people living there neglected to inform the government official. Mr. Hamaker heard of it a week ago Friday and went out there immediately, getting there Friday night. * * *

"Mr. Hamaker says the tract burned

over is about five miles square, and he estimates the loss of timber on the public domain to be about 12,000,000 feet. About 5,000,000 feet of the timber was destroyed on patented land. This was some of the finest timber in the country. Mr. Hamaker says it is not destroyed, and could be utilized for lumber if it were in an accessible locality. But it has been killed and must be used within the next year or it will be worthless. The branches have been burned off, and the bare trunks have been left standing."—*Herald*, Salt Lake City, July 8.

"SANDWICH, Mass., July 20.—A forest fire which now extends over a territory of at least twenty-five square miles and which threatens with destruction nearly a score of towns about this portion of the Cape district, is the result of a blaze started yesterday in the vicinity of Patchville by some berry pickers. Hundreds of men are working night and day to check the progress of the flames, but as the brush is as dry as tinder and as the flames jump first one way and then another they are almost helpless. * * *

"The fire now has no general direction, but is spread out in the district between Sandwich and Buzzard's Bay, bounded by the main line of the Consolidated Road and by the towns of Cataumet, Wenaumet, and the Falmouths, and the brush and timber between is a roaring mass of flames. Oftentimes, backfiring has proved of no avail. It has been a terrible battle for the men, and many are coming out of the woods in an exhausted condition, and they express no hope that the fire will be checked unless rain comes. * * *

"To-night the wind is from the southwest, which is likely to increase rather than diminish the ferocity of the fire. No estimate of the damage already done can be given, nor can anything definite be said as to the progress the flames will make to-night and the probable damage they will cause."—*New York Times*, July 21.

This fire was finally checked by backfiring and the help of a favorable wind after it had burned over thirty square miles.

RECENT PUBLICATIONS.

The Third Annual Report of The Commissioners of Fisheries, Game, and Forests of New York State—1897.

The Annual report of the Commissioners of Fisheries, Game and Forests of New York State for 1897 contains a great deal of matter relating expressly to the forests of New York. In all seven papers are concerned directly with these forests and two more—one on the natural and artificial reservoirs of New York and the other on the State's title to lands on the forest preserve, will have a particular interest for the forester. As a whole this volume, with its handsomely colored illustrations of fish and birds, its many sketches and photographs of hunting and fishing scenes (in which all men appear brave, and all women fair) and its many accurate pictures of the different phases of the forest industries of the State, is in striking contrast to most government reports, and shows that the New York Commissioners realize how great and many-sided is the economic and social importance of the forests over which they exercise control.

The first part of the Annual Report of the Superintendent of Forests, Colonel Fox, gives an account of the areas and conditions of the forest preserves, and statistics about the fires which occurred in it between October, 1896, and January, 1898, and also the usual annual compilation of the statistics showing the product of the Adirondack forests for 1897. In this it is clear that many of the trees which have had little value in the past are one after another coming into commercial demand. Colonel Fox does not fail to point out the significance of this fact and says: "All this means that the time is near when the different species in our forest, both conifers and broad-leaved trees, will become merchantable timber—this growing demand for hardwood, the merchantable character of all the species, will increase the revenue-producing capacity of our woodlands, and enable the State to produce an annual permanent revenue without depending on some one species as at present."

Five of the papers relating explicitly to forestry are of the nature of "tracts and circulars of information," written for the purpose of awakening an interest in the behalf of forestry, and imparting elementary instruction. Colonel Fox prefaces these by saying that they will doubtless appear to some, "A mere repetition of what has been said in one way or another * * * but they were not written for those who had made a study of forestry. They are for the use of the thousands to whom the subject is new, and whose attention is called to it for the first time." They are entitled, Why our Forests should be Preserved and Protected, Fore-

stry, Forest Management, Forest Fires and Tree Planting. For the purpose for which they were written they could hardly be better, and the fact that the information which they contain is not new, does not lessen its value.

The paper which, considered apart from all others, is probably the most interesting and valuable, is that dealing with the maple sugar industry and entitled "A Forest Product." The production of Maple syrup is practically the only forest industry in this country which is widely practiced with forethought and on scientific principles. Its great importance can be gathered from the fact that 17 % of the granulated sugar manufactured in the United States comes from the Maple tree. Colonel Fox gives a brief history of the industry by way of introduction and then goes on to describe the way in which it is now carried on by the most advanced and improved methods. He pays attention to the rules for tapping, the methods of handling the syrup, and to the machinery for evaporating and refining. He also considers at some length records of the amount of sugar produced per tree and per acre under different conditions, and hence of the profitableness of a sugar bush, and takes up the possibility of carrying on the industry in the more southern and northern regions where the Sugar Maple grows, but where it is now valued only for its wood. There is probably no article on the manufacture of sugar and the care of the orchard, as good as Colonel Fox's, and those who are interested in the subject should not fail to read it.

The Forest Wealth of Canada. By James M. MacCoon.

The Wood Pulp of Canada. By George Johnson, F.S.S., Hon., Statistician of the Department of Agriculture, Ottawa.

These two pamphlets are printed for the Paris Exposition by direction of the Canadian Government, and intended, as their method of publication would imply, to convey to foreigners information of the business opportunities in the forests of Canada. Statistics about Canada's forest products, and their value, lists of her trees, their uses and distribution, and a map and illustrations of mills, streams, etc., do this with as much thoroughness as is possible where no attempt to be exhaustive is made. A good deal is put into the pamphlets, however, which attracts even readers who have no intention of investing their savings in Canadian Spruce or Pine. Mr. Johnson's pages on the history of paper and the materials used in its manufacture—since the days of Egypt to the days of "the land of the Spruce tree," Canada, are especially interesting. The second pamphlet shows that in 1891 there were twenty-four pulp factories in Canada rep-

representing \$3,000,000 of invested capital. To-day there are thirty-five mills, and the invested capital is between fifteen and twenty millions.

Statement of Facts Relating to the Proposed Minnesota Park. Published by the Minnesota Park and Forestry Association.

A Little Talk about Michigan Forests. Michigan Forestry Commission.

The Forestry of California and The Distribution of Rain-fall.

These three pamphlets are all in the nature of "educational campaign" literature. All, as such literature should, contain much substantial and useful information.

The Statement of Facts, 'submitted' by the Minnesota National Park Association, is a handsomely printed pamphlet, thirty-four pages in length, which begins with a full description of the boundaries of the proposed National Park, of the character of the land which it contains, and of the game, and fish, which are found in it. The importance of preserving the woods of the region for the sake of the Mississippi which flows for seventy-five miles through it, and which drains its three hundred square miles of water surface, is pointed out and emphasized by a number of quotations from authorities on irrigation and forestry. As the lands within the proposed boundaries of the reserve are now Indian Reservations, the question of dealing with the Indians is taken up with thoroughness. The Nelson Law and the Rice Treaty and their workings are considered, as also the value of the lands and the Pines now standing on them. The conclusion reached in regard to this is given in the following paragraph.

"It is proposed by this Association, that, acting upon the opinion of the best authorities on forestry in this country, the government shall retain these lands, and cut the matured Pine timber from year to year and sell it for the benefit of the Indians; that by keeping out forest fires, clearing up the slashings and caring for the young trees and shrubs, so that they shall not be injured or destroyed, a beautiful natural forest will be preserved for all time to come."

A Little Talk about Michigan contains at the beginning a "Glimpse of the Situation,"—a statement of the present condition of Michigan's

forests, and of the nature of the State's immediate needs. The rest of the pamphlet consists of quotations of different authorities, dealing more or less particularly and in different ways with the same subject. They are all interesting and to the point, and cannot fail to do good wherever they are read.

Two short papers on "The Forestry of California" and the "Variation and Distribution of Rainfall" by Prof. George Davidson and Mr. Marsden Manson respectively, appear as a supplement to the proceedings of the eighth annual convention of the California Miners Association. The first of these goes to some extent into the history of California's forests and their destruction and its effects, points out what is now being done in the way of government examinations and protection, and finally makes clear the "necessity for a thorough and exhaustive examination of the mountain region of California upon the coast and in the interior, for the location of dam and reservoir sites." The pamphlet contains a list of the reservoir sites examined by the U. S. Geological Survey and recommended to the government for reservation from sale, and ends with Mr. Manson's note on "The Variation in and Distribution of Rainfall," in California.

Prof. Davidson devotes some space to the question of forest fires, and says many things about them which are only too true, and which should long ago have been made unnecessary; but he makes one statement which luckily will not hold. He says that as far as his "experience extends in noting this reckless and absolute destruction of millions of forest trees yearly, the trees—say the Douglas Fir of Oregon and our northern coast—do not reappear, but very inferior and almost useless species of trees take their place." The forester would indeed have a discouraging future in the West if this were true. But luckily unless repeated fires occur it is not; in support of which it is enough to point out that in the Red Fir (Douglas Fir) forests of Washington, signs of fire slightly older than the living trees are everywhere to be found. This means that practically all the Red Fir now standing has grown up after fires, not that it exists because the region has been free from fire. Nor has it been shown that the growth which preceded the present Red Fir forest was not also Red Fir.

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1. A more wise and conservative treatment of the forest resources of this continent.
2. The advancement of educational, legislative and other measures to that end.
3. The diffusion of knowledge regarding the conservation, management and renewal of forests, the proper utilization of forest products, methods of reforestation of waste lands, the planting of trees for ornament, and cognate subjects of arboriculture.

The Association desires and needs as members all who are interested in promoting the objects for which it is organized—all who realize the importance of using the natural resources of the country in such a manner as not to exhaust them, or to work ruin to other interests. In particular it appeals to owners of timber and wood-land, to lumbermen and foresters, as well as to engineers, professional and business men who have to do with wood and its manifold uses, and to persons concerned in the conservation of water supplies for irrigation or other purposes.

Forest matters are being discussed by committees of national and State legislatures and by the public. Much good can be accomplished if there is organization of effort.

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